DOCUMENT RESUME

ED 383 544 SE 056 152

AUTHOR	Vaille, John; Kushins, Harold
TITLE	Creative Math Assessment: How the "Fizz & Martina Approach" Helps Prepare Students for the Math Assessment Tests.
PUB DATE	93
NOTE	27p.
AVAILABLE FROM	Tom Snyder Productions, Inc., 80 Coolidge Hill Rd., Watertown, MA 02170-2817 (free).
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Achievement Tests; Elementary Education; Mathematics Curriculum; Mathematics Education; *National Competency Tests; *Student Evaluation; *Test Reviews
IDENTIFIERS	*Alternative Assessment; *California

ABSTRACT

Many school districts around the nation are re-evaluating how they measure student performance in mathematics. Calls have been made for alternative, authentic assessment tools that go beyond simple, and widely ineffective, multiple-choice tests. This book examines how the Fizz & Martina math video series provides students with hands-on practice for the new assessment techniques used in the California Learning Assessment System (CLAS). Discussion considers students, curriculum, and assessment; more than mimicry mathematics; measuring mathematical power: CLAS as a mathematical power meter; CLAS enhanced multiple-choice questions; open-ended problems; what the CLAS open-ended questions ask of students; what Fizz and Martina do with students; and how Fizz and Martina help prepare students for CLAS. Contains a list of 12 selected readings. (MKR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 383 544

Creative Math Assessment

Written by
John Vaille and Dr. Harold Kushins

How the "Fizz & Martina approach" helps prepare students for the math assessment tests.

SE 054 152

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
LISA HEANEY
BEST COPY AVAILABLE
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Preface

Many school districts around the nation are re-evaluating how they measure student performance in mathematics. Calls are going out for alternative, "authentic" assessment tools that go beyond simple–and widely ineffective–multiple choice tests. The state of California has recently begun implementation of a gradual revamping of the state-wide math assessment test, California Learning Assessment System known as CLAS.

Most states have created tests similar to the CLAS test, so this book will be a valuable resource for any math teacher in any state.

In this book two California elementary school principals, Dr. Harold Kushins and John Vaille, examine how the Fizz & Martina math video series provides students with hands-on practice for the new assessment techniques used in CLAS.

Copyright Notice
Copyright © 1993 Tom Snyder Productions, Inc.
All rights reserved.

This manual is copyrighted. All rights are reserved. This document may not, in whole or part, be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form other than that which has been specified herein without prior written consent from Tom Snyder Productions, Inc.

Tom Snyder Productions is a registered trademark of Tom Snyder Productions, Inc.

About the Authors

John Vaille and Harold Kushins are the co-authors and principals of elementary schools in Tracy, California. They have been using *The Wonderful Problems of Fizz and Martina* with their fourth grade students and teachers for the past two years as a way of increasing the students' Mathematical Power. Both are currently involved with teams of teachers in the development of multimedia-enhanced, integrated, thematic instructional units.

John Vaille is the immediate past president of California's Computer-Using Educators and a member of both the California Department of Education's Educational Technology Committee and the California Planning Commission for Educational Technology.

Dr. Harold Kushins' interest in the relationship between this series and the CLAS was heightened when the 4th grade CLAS Mathematics test was field tested at his school in 1991. Dr. Kushins received his B.A., M. A. and teaching credential from San Jose State University and his administrative credential and doctorate from the University of California, Berkeley.

The authors would like to acknowledge the fourth grade teachers and students at Gladys Poet-Christian and South/West Park Elementary schools for providing them with the opportunity to learn about Fizz and Martina alongside them.

Contents

Talking Math with Fizz & Martina 6

Introducing Fizz & Martina, Agents of Change 8

Changing Faces 9

Students, Curriculum & Assessment

Mathematical Power 11

More than Mimicry Mathematics

Measuring Mathematical Power 12

CLAS as a Mathematical Power Meter

Fizz & Martina Do CLAS 14

CLAS Test Enhanced Multiple-choice Questions ... 15

What the CLAS Enhanced Multiple-choice Questions Ask of Students

What Fizz & Martina Do With Students

CLAS Mathematics Test 19

Open-ended Problems

What the CLAS Open-ended Questions Ask of Students

What Fizz & Martina Do With Students

How Fizz & Martina Help You Prepare Your Students for CLAS 23

Selected Reading 25

Talking Math with Fizz & Martina

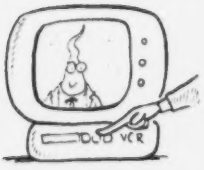
Tom Snyder, in his introduction to the Teacher's Guide to *The Wonderful Problems of Fizz & Martina*™ tells of once hearing philosopher, educator and psychologist Jerome Bruner suggest that "clear thinking becomes almost effortless when a person is immersed in a story." Snyder goes on to describe his memories of a childhood world in which stories were at the heart of learning, but in which mathematics and numbers had no place in his play. In his teaching experience, however, stories have played a central role in the learning environment he has created for his students. These environments have created worlds for Snyder's students in which they develop Mathematical Power while deep in challenging scenarios. Challenges that are interesting because they are based in stories which his children find too good to resist.

Tom Snyder Productions has developed *The Primary Problems of Fizz and Martina*™ (for grades 1-3) and *The Wonderful Problems of Fizz and Martina* (for grades 4-6) which bring this special mathematics environment to your classroom. This unique video series provides a fun, dramatic context in which students work cooperatively through a unique process of math problem solving. While they are involved doing this, they must come to a correct solution with the other members of their Coaching Team, and articulate, orally and in writing, the process which lead them to

COACHING TEAMS
Coaching Teams place students in cooperative learning groups where success is dependent upon the each team member working with, coaching or being coached by others in the group.

their conclusion. To accomplish this students begin to "talk math" as they "make public" their mathematical thinking processes. Both series include several titles, each presenting a different challenge to students. Each series comes with a video, a Teacher's Guide, 30 Student Activity Books and a set of specially designed award/incentive cards. Here's how it might work your classroom:

TALKING MATH
Talking Math is the ability to articulate the methods and strategies one uses in mathematics problem solving.



Hushed excitement rumbles from your students who are huddled into teams. They've been buzzing about this all week. Last week's cliffhanger was a doozy!

The VCR whirs on. The soundtrack flows and the vivid colors grab everyone's attention. The story continues. After a few minutes of colorful drama, our hero Fizz and his best friend Martina are faced with a problem. You pause the VCR. Your kids are ready.

The magic continues. Kids begin "talking math" excitedly within their groups. The students coach each other because they realize that team success depends on every member being prepared. Even the shy students are pulled into the action. "Everybody ready?" You call on Ben, probably your least successful math student. Kind of a loner too. But Ben proudly says, "Fifteen minutes."

Ben then explains how his team figured out the problem. "I added the amount of time it took Fizz to ride his bike home to the length of time he stopped to talk to Martina."

Ben and his team predict that Fizz will be in big trouble for being late. The whole team cheers as you present four award cards for excellent problem solving and teamwork well done.

You press "play." The room goes quiet. It's showtime again.

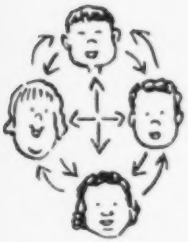
Introducing Fizz & Martina, Agents of Change

You might wonder how a technology-based instructional video series which involves groups of students in creative investigations of real-life, meaningful problems can pretend to prepare those students to succeed on something as traditional as a state achievement test. Well, if you haven't looked lately, the California Learning Assessment System (CLAS)* Mathematics Test has undergone some remarkable and significant changes. These changes have made this important assessment instrument more like *The Wonderful Problems of Fizz & Martina* and *The Primary Problems of Fizz & Martina* than like the multiple-choice computation instrument we all remember. Want to learn more? Read on...

CLAS
The California Learning Assessment System (CLAS) is a series of tests given to every California public school student in grades 4, 8, 10.

*** The CLAS test was formerly known as the CAP test. For convenience we have updated all past references of CAP to refer uniformly to CLAS.**

Changing Faces



Students, Curriculum & Assessment

California's student population is very different from the one that its schools served a generation ago. Students in today's classrooms come from richly diverse backgrounds – ethnically, economically, socially, experientially, and in many other ways. One out of six California students is born in a foreign country, 29% come to school dominant in a language other than English, and the number of California students living in poverty has doubled between 1969 and 1987 (Fact Sheet, 1992). The definition of a well-educated citizen has also evolved. Today's students will be citizens of an information age (or perhaps a post-information age) which will value and reward life-long learning, working with others, and the effective use and interpretation of information. These conditions require fundamental change in the way we prepare students for their future as citizens.

The needs of these children are at the heart of a revolution that is shaking the foundations of schools across the nation. The reform movement in California has, for the past ten years, been re-aligning the three key areas of Curriculum, Instruction and Assessment. California's curriculum Frameworks have incorporated new understandings, derived from research and practice, of the nature of learning and teaching. Changing curricula have dictated the use of advanced instructional practices, such as cooperative learning, in more learning environments and classrooms.

Finally, these new understandings have caused fundamental changes in the way California assesses student progress. The new CLAS tests for Grades 4, 8, and 10 assess student performance more authentically and are ready for use in April, 1993.

Mathematical Power

More than Mimicry Mathematics

The 1992 Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve (Mathematics Framework) describes the model mathematics learning environment as one which challenges students to develop Mathematical Power. Mathematically powerful students think and communicate effectively. They draw upon mathematical ideas and use mathematical tools and techniques to face real-life challenges both in and out of the classroom. Therefore the development of thinking and communication skills is the primary objective of California's mathematics curriculum. Mathematical ideas, tools and techniques become the medium in and through which the process develops in students. Active and cooperative learning and student-centered learning environments become core strategies in the development of Mathematical Power.

MIMICRY MATHEMATICS
Mimicry Mathematics is typified by the statement: "I got the answer, but I can't tell you how." Mathematics knowledge based upon rote memorization of the operations of mathematics without understanding or the ability to apply those processes to unique challenges.

MATHEMATICAL POWER
Mathematical Power is thinking and communicating effectively, drawing upon mathematical ideas and using mathematical tools and techniques to face real-life challenges.

Measuring Mathematical Power

CLAS as a Mathematical Power Meter
If you wish to measure students' Mathematical Power you can only use instruments which authentically assess students' thinking, their use of mathematical ideas, tools and techniques, and their communication skills.

Mathematical Power is developed in an environment where

"...students are not endlessly repeating procedures that produce single, correct answers; rather, they are given opportunities to construct their own mathematical understandings from open-ended encounters with challenging situations... They frequently work together, sharing numerical estimates and discussing their ideas about how to find answers. Students explain their thinking, orally and in writing, and build their understanding of mathematics over a long period of time." (It's Elementary, 1992)

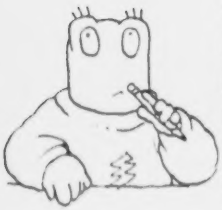
"[CLAS] plans to adopt (a) new way of looking at student achievement - a well-defined standard of performance rather than relating work to other students' (norm referenced) or fixed (criterion) score. Performance standards are bench-marked descriptions of the quality of performance against which actual student work can be compared." (Mathematics Sampler, 1991)

Although its implementation may be limited in its early versions, the CLAS test is intended to be a highly authentic assessment of student progress in mathematics. The CLAS Mathematics test presents students with engaging tasks which commit the

to solving the problem. These challenges are presented in an environment which provides students with the time, resources and tools needed to face the challenges posed by the problem. These assessments also require students to communicate both the process used to derive a solution as well as the results of that process.

The CLAS Mathematics test, when completely implemented, will employ four types of assessment strategies: Open-ended Problems, Enhanced Multiple-choice Questions, Investigations, and Portfolios. Since all of these assessment strategies attempt to be "authentic" assessments of students' Mathematical Power, their formats are a huge departure from what those students are accustomed to seeing in a standardized test. Since these new approaches will require different skills and abilities, it is only fair that students be prepared with appropriate practice. As we said previously, *The Wonderful Problems of Fizz & Martina* and *The Primary Problems of Fizz & Martina* can provide your students with the practice and experience to successfully demonstrate their Mathematical Power on the CLAS.

Fizz & Martina Do CLAS



Let's take a look at how *The Wonderful Problems of Fizz & Martina* can prepare you and your students for authentic assessment in general and for the new CLAS mathematics tests in particular. Over the next few years CLAS will increase its requirement that students communicate not only their answers, but also the process by which they arrived at them, either in a narrative or through the use of illustrations (i.e., charts, graphs, diagrams). *The Primary Problems of Fizz and Martina* and *The Wonderful Problems of Fizz & Martina* are the only video-based series that are specifically designed to require students to write about their mathematical thinking. The writing process is an integral part of this series - Fizz & Martina are not just fancy versions of computational worksheets.

Initially, the CLAS Mathematics Tests will be limited to two assessment strategies – Enhanced Multiple Choice and Open-Ended Questions. Let's take a look at how *The Primary Problems of Fizz & Martina* and *The Wonderful Problems of Fizz & Martina* can be used to increase student awareness, familiarity, and skill with these types of assessment.

> *"We must ensure that tests measure what is of value, not just what is easy to test. If we want students to investigate, explore, and discover, assessment must not measure just mimicry mathematics." (Everybody Counts, 1989)*

CLAS Mathematics Test Enhanced Multiple-choice Questions

The familiar multiple-choice question usually asks for a single correct answer in a limited amount of time and requires the student to use a single, or at most two, skills or processes. CLAS test designers have expanded the multiple choice format to challenge the test-taker to use a variety of strategies to arrive at the most appropriate answer. Since these questions require more processing, students will be given more time to prepare responses. Since this is the most likely assessment strategy to appear on the 4th and 8th grade tests, let's compare a CLAS item with an activity from *The Wonderful Problems of Fizz & Martina.*

Bill is invited to attend a party given today. His invitation reads:

You are invited to a Birthday Party.

Date:	**April 14th**
Time:	**2:30 p.m.**
Place:	**John's House**

Bill has to run an errand for his Mom on the way to the party. It will take him 20 minutes. It takes Bill a half hour to get ready for the party and 15 minutes to get to John's house. Bill's watch reads:

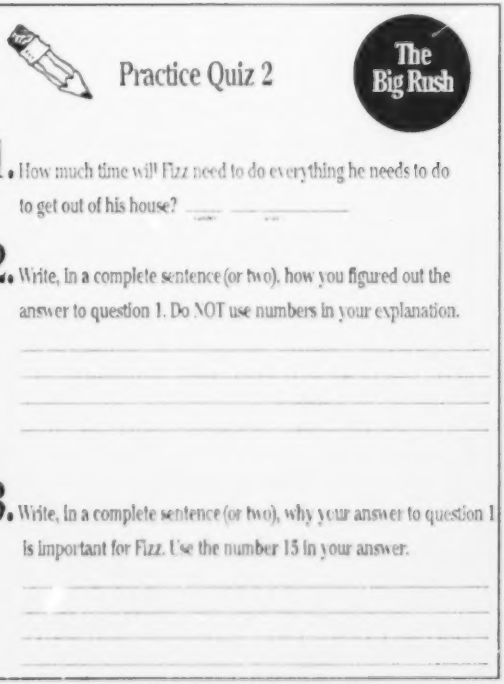
Does Bill have enough time to get to the party on time?

A. Bill will be 10 minutes late.
B. Bill will be 5 minutes late.
C. Bill will have 10 extra minutes to get to the party.
D. Bill will have 20 extra minutes to get to the party.

Table 1
Example 16 from A Sampler of Mathematics Assessment

BEST COPY AVAILABLE

In *The Wonderful Problems of Fizz & Martina* (Volume 1, Episode 3), students are asked to determine whether or not Fizz can get to his bike, ride home, pack his things, and leave before his uncle gets home. Students are given the time he starts, how long it will take him to do these three things, and how long it will be before his uncle gets home. As you can see, this problem is similar to the CLAS item example, requiring students to perform multiple step mathematical explorations, use a variety of mathematical tools and concepts, make decisions regarding strategy, and justify their solution.



Practice Quiz 2

The Big Rush

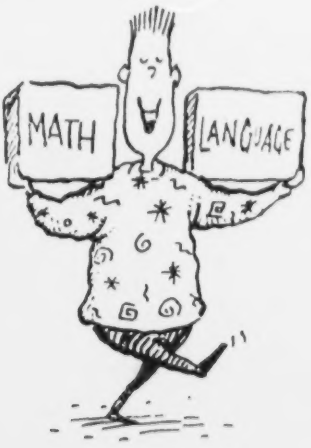
1. How much time will Fizz need to do everything he needs to do to get out of his house? ____ ____

2. Write, in a complete sentence (or two), how you figured out the answer to question 1. Do NOT use numbers in your explanation.

3. Write, in a complete sentence (or two), why your answer to question 1 is important for Fizz. Use the number 15 in your answer.

Table 2
Student Follow Along Worksheet from Fizz & Martina

The following chart shows the relationship between the processes that the CLAS Enhanced Multiple-choice Question format uses and those employed in student challenges in both Fizz & Martina series.



What the GLAS Enhanced Multiple-choice Questions Ask of Students	What Fizz & Martina Do With Students
Students are required to make connections among several concepts to arrive at the correct answer.	Requires students to perform the computation necessary to come up with the correct answer and to write down, without using numbers, how they arrived at their answer. Usually there are several different approaches that are possible, and the act of writing causes the students to bring to a conscious level their thought processes. Tom Snyder describes this process as "talking math" - the ability to articulate and express on paper the methods and strategies one uses in mathematics problem-solving.
Students must use a variety of strategies in solving a problem.	As students move along in *The Wonderful Problems of Fizz & Martina*, they are required to do two-step problems (e. g., finding half of something before it is added with other figures to arrive at a total). Many of the Fizz & Martina challenges can be met using a variety of mathematical tools and approaches (e.g., students may choose to repeatedly add rather than multiply). Their selection of these tools and approaches can provide the teacher with an insight into the students' mathematical sophistication. As a member of a Coaching Team every student has access to other students' thinking and to individuals who model more sophisticated problem-solving processes.

CLAS Mathematics Test

Open-ended Problems

CLAS has designed Open-ended Problems so that students are presented with a challenge which requires a written response using a variety of tools (i.e., prose, formulae, graphs, charts). These challenges have been written so that there may be more than one answer and/or more than one way to reach that solution. They also engage the interest of the students and allow them to begin at different points depending on their understanding of the challenge.

Sample Problems

This section is composed of a collection of both open-ended problems and enhanced multiple-choice questions that can be adapted for the appropriate grade level. Feel free to use any of these problems in your classroom.

Open-Ended Problems

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Scientists have decided to beam this 99 chart out to all known stars and galaxies. They hope that space aliens will pick up and understand something about our world. Some of the scientists thought it would be a good idea to send patterns that can be found on the 99 chart. If someone gets the patterns and the 99 chart, maybe they will learn more about us.

The scientists want your help. Find a pattern that you would like to send into space. You can show any pattern that you think will help the space aliens learn something about us or our number system.

Be sure to:

- Circle the numbers in your pattern on the 99 chart.
- Explain with words and pictures how you know that the numbers you circled show a pattern. (You may show your pattern in another way than on the 99 chart—on another piece of paper.)
- Explain why you chose your pattern and what you hope the space aliens will learn.

Students' performance on these types of questions will be evaluated based upon students' ability to identify essential mathematical elements of the challenge, explore these elements and formulate hypotheses, use appropriate mathematical skills and tools, and communicate their findings effectively.

Table 3
A Sampler of Mathematics Assessments

In *The Wonderful Problems of Fizz & Martina*, at the end of each episode (every two lessons) students have the opportunity to write their own story. This can either be completely open-ended (may or may not have anything to do with Fizz & Martina) or may be related to a scene or situation from the video. The following chart shows the relationship between the processes that the CLAS Open-ended Questions format uses and those employed in student challenges in both Fizz & Martina series.

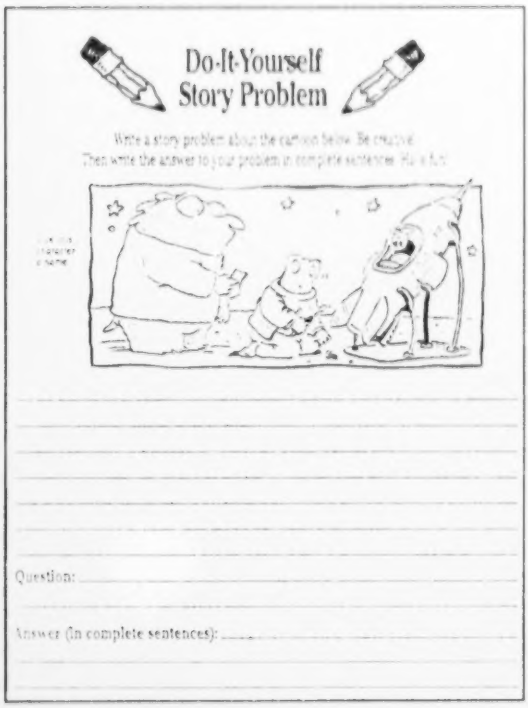


Table 4
Example "Do-It-Yourself" Story Problem from student workbook

What the CLAS Open-ended Questions Ask of Students	What Fizz & Martina Do With Students
An interesting situation which engages students and involves several mathematical concepts.	**There are a number of aspects to the** cartoon characters that engage student interest - hints of Fizz's conflicting feelings toward Martina (friend or girlfriend), dealing with "the bully," adults who don't understand, and "weird" music. Students are engaged by the various characters found in *The Wonderful Problems of Fizz & Martina* and are, in turn, interested and motivated to write their own stories based upon the characters or similar situations.
There may be multiple solutions that allow students to make their own assumptions about the problems and develop their own creative responses.	Student-created problems (stories) reflect the level of students' Mathematical Power. Some students will write stories that closely parallel ones they have experienced in *The Wonderful Problems of Fizz & Martina* and that contain similar mathematical problems. Others will attempt completely different formats that reflect sophisticated mathematical thinking. In addition to writing a story, students are also required to indicate the strategies they would use in solving the problem. An interesting outcome of this approach is that students often apply a different set of strategies than the author intended or anticipated. This reinforces the important concept that there are often multiple approaches to solving mathematical challenges.

What the CLAS Open-ended Questions Ask of Students	What Fizz & Martina Do With Students
CLAS provides an audience that creates the need for students to communicate effectively using appropriate tools such as charts, graphs, and diagrams.	**Students write for both their teacher and** each other. Since students are rewarded based upon the performance of the Coaching Teams, students have an obligation to share their thoughts and answers with other Coaching Team members. This ensures that every member of a Coaching Team has a clear understanding of the possible solutions. Since this information must also be written, teachers can access it. Finally, the stories that individual students write can serve as excellent "sponge" and/or review activities for the entire class.
Students work in groups to identify key mathematical elements of a problem or challenge.	Coaching Teams work cooperatively, gathering the clues needed to answer the questions embedded in the videotape segments. Members pool information and identify the relevant data and work together to ensure that everyone answers questions when asked by the teacher.
Communicate using charts, graphs and written explanations of their findings.	A major emphasis in *The Wonderful Problems of Fizz & Martina* is on writing skills. Each episode requires students to explain their answers in writing. Within the Coaching Team, students have a responsibility to communicate information to other members and to assist others in understanding the strategies used to solve the problem.

How Fizz & Martina Help You Prepare Your Students for CLAS

Obviously not all the problems that appear in the CLAS test will be closely paralleled in *The Wonderful Problems of Fizz & Martina* and *The Primary Problems of Fizz & Martina* However, by requiring students to write down their thought processes, it will give you important insights into students' thinking. Working with students to develop more appropriate and/or higher levels of Mathematical Power becomes easier if you have the ability to consistently track how students solve problems.

For a student taking a traditional multiple-choice standardized test (such as the previous CLAS test), the only measure of success is whether the answer is right or wrong. But, is the answer correct because of a lucky guess or did an inappropriate strategy, done incorrectly, yield a correct answer? Is the answer incorrect because of the use of inappropriate strategies to solve the problem or was there a minor error within the context of an appropriate strategy? (The student was on the right track, but didn't "carry.") Further, there is no way of judging the students' level of sophistication used in an attempt to solve the problem. Finally, there is little incentive for students to understand and clearly communicate the strategies that went into their efforts.

SPONGE ACTIVITY
A Sponge Activity is a short activity, used at a time which might otherwise be wasted (waiting for the kids to cleanup before recess), which quickly consolidates knowledge of or provides practice with previously learned material.

The new CLAS test is designed to put an end to the familiar refrain "I know how to do it, but I can't

explain it." It is rapidly moving in the direction of requiring students to communicate thought processes through a variety of means, with written explanation of the greatest importance. Students who "know the answer, but can't explain it" are going to do poorly on the new CLAS. If students are to successfully face such a radical change in testing, there must be an accompanying change in the way that we prepare our students. Writing about the strategies and procedures used in mathematics is a new experience for a majority of students. Writing about mathematics is a skill that is developed over time - it is not something that can be taught a few weeks before the test. The use of a comprehensive and engaging series such as *The Primary Problems of Fizz & Martina* and *The Wonderful Problems of Fizz & Martina* is an important first step in this long and challenging process.

One final note. CLAS Mathematics Test is clearly designed to reflect student achievement up to the point at which the test is taken. The 4th grade test is not just a measure of how well the fourth grade teacher did, but rather a measure of students' school experience to that point. The same is true for the 8th grade and 10th grade tests. For the primary grades, *The Primary Problems of Fizz & Martina* is an excellent way for students to begin the process of "talking mathematics" while *The Wonderful Problems of Fizz & Martina* is valuable not only in fourth grade, but also in fifth and sixth as a way of developing Mathematical Power.

Selected Reading

Caught in the Middle: Educational Reform for Young Adolescents in California Public Schools. Report of the Superintendent's Middle Grades Task Force. Sacramento: California Department of Education, 1987.

Curriculum and Evaluation Standards for School Mathematics. Reston, Va.: National Council of Teachers of Mathematics, 1989.

Educational Leadership, Vol. 46, No. 7 (April, 1989). Special issue on assessment.

Educational Leadership, Vol. 49, No. 8 (May, 1992). Special issue on assessment.

Everybody Counts: A Report to the Nation on the Future of Mathematics Education. Washington, D.C.: National Academy Press, 1989.

Fact Sheet – 1992-93: Handbook of Educational Information. Sacramento: California Department of Education, 1992.

Here They Come: Ready or Not! Report of the Superintendent's School Readiness Task Force, Sacramento: California Department of Education, 1988.

It's Elementary! Report of the Superintendent's Elementary Grades Task Force. Sacramento: California Department of Education, 1992.

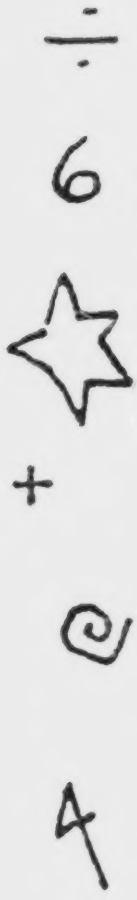
Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve. Sacramento: California Department of Education, 1985.

Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve. Sacramento: California Department of Education, 1992.

A Sampler of Mathematics Assessment. Sacramento: California Department of Education, 1991.

Second to None: A Vision of the New California High School. Report of the Superintendent's High School Task Force. Sacramento: California Department of Education, 1992.

Creative Math Assessment



You might wonder how a technology-based instructional video series which involves groups of students in creative investigations of real-life, meaningful problems can pretend to prepare those students to succeed on something as traditional as a state achievement test. Well, if you haven't looked lately, the California Learning Assessment System (CLAS) Mathematics Test has undergone some remarkable and significant changes. These changes have made this important assessment instrument more like *The Wonderful Problems of Fizz & Martina* and *The Primary Problems of Fizz & Martina* than like the multiple-choice computation instrument we all remember.

Other schools across the U.S. are also moving toward more authentic measures of student performance – and the Fizz & Martina series is a perfect vehicle! This booklet will interest educators from any state looking for alternative assessment techniques.

To find out more about *The Wonderful Problems of Fizz & Martina* for grades 1-6, or to get free additional copies of this booklet, contact:

Tom Snyder Productions, Inc.
80 Coolidge Hill Road
Watertown, MA 02170-2817
1-800-342-0236.

BEST COPY AVAILABLE